

The terrestrial isopod fauna of the Hortobágy National Park

by

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Abstract: The terrestrial isopod collection of the Hungarian Natural History Museum was examined. Five species, *Armadillidium vulgare* Latr., *Porcellium collicola* Verh., *Porcellio scaber* Latr., *Trachelipus rathkii* Brdt. and *Cylisticus convexus* de Geer were found. Both *A. vulgare* and *P. collicola* were most abundant in forest communities, while *T. rathkii* occurred largely at forest edges.

Key words: Isopoda, Oniscidea, distribution, Hortobágy National Park, Hungary

INTRODUCTION

The Hortobágy National Park (HNP thereafter), the first national park in Hungary, was established in 1972. Its unique geology and landscape attracted great attention of both botanists and zoologists. Several collecting trips were organized and long term studies were also initiated. The research was coordinated by the Hungarian Natural History Museum. The results of these projects are summarized in a three volume book (MAHUNKA 1981, 1983, SZUJKÓ-LACZA 1982), where 80% of the fauna is listed. Terrestrial isopods are not treated in this book. The isopod collection of the Natural History Museum was examined and the results of this evaluation are presented in this paper.

MATERIAL AND METHODS

The material was collected between 1974 and 1976. Pitfall traps were used primarily, but other collecting methods, such as mesh sieving and singling were also used. Sampling was fairly regular at Újszentmargita, where the pitfall traps were emptied monthly between March and September in the first two years. Here different plant communities were sampled. Collecting trips to other localities were much more irregular. The material was stored in 70% isopropyl alcohol. Each specimen was individually examined, identified, and their maturity and sex were also recorded. A detailed botanical description as well as a map of HNP and the adjoining nature conservation areas are given in SZUJKÓ-LACZA (1982).

RESULTS AND DISCUSSION

Species composition and distribution

A total of 2932 specimens were examined. They belong to five species, *Armadillidium vulgare* Latr., *Porcellium collicola* Verh., *Porcellio scaber* Latr., *Trachelipus rathkii* Brdt. and *Cylisticus convexus* de Geer. *Porcellio scaber* was found around a building, and *Cylisticus convexus* is represented by only one specimen. Both species commonly occur around human settlements. The occurrence of the other three species are shown in Table 1. Unfortunately not all the labels contain information about the habitats of the animals. Nonetheless they seem to be widely distributed throughout the National Park since these localities cover a large part of it.

Table 1. Occurrence of the three most abundant terrestrial isopod species in the Hortobágy National Park and the adjoining nature conservation area.

Locality	<i>A. vulgare</i>	<i>P. collicola</i>	<i>T. rathkii</i>
Újszentmargita			
forest	x	x	x
forest edge	x	x	x
meadow	x	x	x
reeds	x	x	x
Óhat			
forest	x	x	x
Darassa			
?	x		x
Vajdalapos			
forest	x	x	x
Görbehát			
?	x		x
Kunmadaras-Dőghalom			
?	x		
Ágotapuszta			
forest		x	

Out of the three species two - *Armadillidium vulgare* and *Trachelipus rathkii* - are widely distributed throughout the world. *Trachelipus rathkii* is one of the most expanding species in North America (GRUNER 1965). *Porcellium collicola* had been considered a Central European species until recently, when SCHMALFUSS (1985) reported the species from Greece. Its occurrence here, in the saline Hortobágy was so unexpected, that LOKSA (1973), who regularly sampled the soil fauna of Újszentmargita from 1969 to 1970, found it necessary to give a detailed description of the species.

Population characteristics

The collecting method, being qualitative, allows only qualitative evaluation of the populations. Nonetheless some remarks still could be made especially based upon the Újszentmargita material that yielded the largest number of individuals (Table 2.). Sex ratio seems to be close to one for both *T. rathkii* and *P. collicola*, whereas females are in majority in the *A. vulgare* population. However, while this

ratio is remarkably constant in 1974 and 1975 (0.79 and 0.78, respectively) for the latter species, it varies greatly for the other two. *P. collicola* is especially interesting, where out of the 173 individuals (collected in 1975) 143 were males, and only 30 females were caught.

Table 2. Population data of the three most abundant isopod species in Újszentmargita. Data for 1974 and 1975 are combined. (N: number of individuals, M: male, F: female)

	N	Adults		Juveniles %	Sex ratio (M/F)	Females in % of adults
		M %	F %			
<i>A. vulgare</i>	1973	31.2	39.6	29.2	0.79	56.0
<i>P. collicola</i>	639	46.5	43.7	9.9	1.06	48.4
<i>T. rathkii</i>	308	46.1	47.1	6.8	0.98	50.5

HOWARD (1940) found that in stable *A. vulgare* populations female are in excess (about 71 %), and BEYER (1957) also reported higher percentage of females. On the other hand, SORENSEN & BURKETT (1977) and PARIS & PITELKA (1962) found that sex ratio varied considerably throughout the year. The latter authors concluded that the sex ratio is equal in the young, but males become dominant in older age classes.

Sex ratio data for *T. rathkii* are not less contradictory. In MCQUEEN's study (1976) the values showed great fluctuation, whereas SNIDER & SHADDY (1980) reported a more constant sex ratio, around 60% females. BEYER (1957) also found female dominance (about 70%) in his study. He points out that different collecting methods may yield different sex ratios.

To my knowledge no data are available in the literature for *P. collicola*. In another faunistic survey (SZLÁVECZ 1988) I found that the *P. collicola* population consisted of 66 % females, which is different from the values reported here.

Sex ratio data are difficult to interpret (MCQUEEN 1976) especially if pit-fall traps are used. Behavioural differences (eg. different activity patterns, degree of aggregation) or different mortality can result in different ratios (PARIS & PITELKA 1962, MCQUEEN 1976). The values can be different among different populations of the same species (HORNUNG 1988) or, even within a population in different microhabitats (HOWARD 1980). In our case perhaps sample size was also too small to obtain a more consistent value.

The three species, although found in all examined plant communities at Újszentmargita, were not equally distributed among them (Fig. 1). *Armadillidium vulgare* was most abundant in the relic oak forest in each of the samples. MILLER & CAMERON (1987) found the same tendency, when comparing *A. vulgare* populations of an oak forest and the neighbouring grassland in Texas. *Porcellium collicola* also seems to prefer this habitat or its edge most of the time. The traps in the meadow never caught more than five individuals, and isopods were caught in the reeds only once. *Trachelipus rathkii* was the least common in the forest, it occurred primarily in more open habitats and in the transitional area between the oak forest and the meadow. The abundance of this species, however, was generally low. LOKSA (1973) reported similar results in his study.

Armadillidium vulgare						
	forest	edge	meadow	reeds	N	P
May 74				X	37	.001
Jun 74			X		157	.001
Sep 74			X		1215	.001
Apr 75		X			49	.001
May 75				X	140	.050

Porcellium collicola						
	forest	edge	meadow	reeds	N	P
May 74				X	71	.001
Jun 74			X		81	.001
Sep 74			X		161	.001
Apr 75		X			34	.010
May 75				X	144	.001

Trachelipus rathkii						
	forest	edge	meadow	reeds	N	P
May 74				X	37	.001
Jun 74			X		16	.001
Sep 74			X		117	.001
Apr 75		X			21	.010
May 75				X	76	.001

Fig. 1. Distribution of *Armadillidium vulgare*, *Porcellium collicola* and *Trachelipus rathkii* among different habitats at Újszentmargita. Grey scale indicate rank of the abundance, black being the first. N: total number of individuals. P: probability of Chi-square test. X: no samples taken. Samples with less than fifteen individuals were omitted from this analysis

SUMMARY

The terrestrial isopod fauna of the Hortobágy National Park is poor. All but one species are cosmopolitan, their occurrence was not surprising. *Porcellium collicola*, however, was not expected here, since this species was known to occur in mountain or foothill forests.

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